

## ***Acacia* Miscellany 9. The taxonomic status of *Acacia coriacea* (Leguminosae: Mimosoideae: Section *Plurinerves*)**

R.S. Cowan and B.R. Maslin

Western Australian Herbarium, Department of Conservation and Land Management,  
PO Box 104, Como, Western Australia 6152

### **Abstract**

Cowan, R.S. & B.R. Maslin. *Acacia* Miscellany 9. The taxonomic status of *Acacia coriacea* (Leguminosae: Mimosoideae: Section *Plurinerves*). Nuytsia 9(1): 83-90 (1993). *Acacia coriacea* DC. is regarded as comprising three subspecies, subsp. *coriacea* (which is here lectotypified), subsp. *pendens* Cowan & Maslin, subsp. nov. and subsp. *sericophylla* (F. Muell.) Cowan & Maslin, comb. et stat. nov. These are described and compared with the similar appearing *A. stenophylla*; a key is provided to distinguish the four taxa.

### **Introduction**

The name *Acacia coriacea* DC. has in the past been applied to plants occurring from the islands off the north-west coast of Western Australia and eastwards across Northern Territory to Queensland, New South Wales and South Australia. An extensive suite of collections from this geographic range has been examined in an attempt to understand the morphological heterogeneity observed both in the herbarium and in the field. Our studies have led us to recognise *A. coriacea* as an aggregate species comprised of three subspecies, two confined almost completely to the Pilbara region in north-western Western Australia (subsp. *coriacea* and subsp. *pendens* Cowan & Maslin, subsp. nov.) and the third, subsp. *sericophylla* (F. Muell.) Cowan & Maslin, comb. et stat. nov., occurring in all mainland states except Victoria. Although subsp. *sericophylla* has a distinctive facies in the field (see below), it cannot always be reliably distinguished from the other two on herbarium material. Future studies may show that it is preferable to re-instate subsp. *sericophylla* as a distinct species, but we believe that regarding it as a subspecies of *A. coriacea* better serves the practical needs of users who need to apply a name to new collections while at the same time recognising the incipient-species nature of the constituent elements. A key will serve to summarise the data on which our conclusions are based. *Acacia stenophylla* Cunn. ex Benth. is included here because it is frequently confused with *A. coriacea* and is superficially similar, but they are probably not very closely related.

All measurements are from dry material unless specifically noted otherwise.

## Key to taxa

1. Pods longitudinally venose-striate, coriaceous, dehiscent in 2 complete valves; seeds with a conspicuous orange aril covering 1/3-1/2 of seed, pleurogram open; raceme axis absent or very short, one or two flower heads per node; phyllodes finely nerved, the spaces between them less than diameter of nerves (*A. coriacea*)
  2. Bark thin, fibrous and hard; flowering peduncles typically 5-10 mm long; pods  $\pm$  twisted and coiled before dehiscence
    3. Phyllodes mostly more or less erect, almost straight to very shallowly incurved, 5-10 mm wide ..... 1a. subsp. *coriacea*
    3. Phyllodes and branchlets pendulous, producing weeping habit; phyllodes shallowly to strongly recurved, 1.5-5 mm wide ..... 1b. subsp. *pendens*
  2. Bark thick and spongy, yellow inside; flowering peduncles mostly more than 10 mm long; pods curved or straight, becoming twisted after dehiscence; phyllodes 1.5-12 mm wide ..... 1c. subsp. *sericophylla*
1. Pods not striate, woody, indehiscent but easily fragmenting transversely between the seeds; seeds exarillate, funicle white and slightly enlarged at hilum, pleurogram nearly closed at base; racemes normally with a well-developed axis and several flower-heads; phyllodes with many slightly raised nerves separated by spaces which are obviously wider than diameter of nerves ..... 2. *A. stenophylla*

1. *Acacia coriacea* DC., Prodr. 2: 451 (1825); Mem. Legum. pt. 8: 446 (1827)

*Lectotype* (here selected): Western Australia (sphalm. "Nouvelle-Holland. orient."), [June-July 1801, N. Baudin Expedition s.n.], unlabelled fruiting specimen on type sheet (G-DC); *islecto*: K, P. *Paralectotype*: labelled flowering specimen on type sheet (G-DC, P).

Spreading *shrubs* or *trees* 1-10 m tall. Young new growth yellow-green sericeous. *Bark* thin, fibrous and hard or thick and spongy. *Branchlets* sometimes pendulous, glabrous to minutely sericeous. *Phyllodes* narrowly elliptic to ligulate, 10-33 cm long, 1.5-12 mm wide, coriaceous to rigid-coriaceous, almost straight to shallowly arcuate, occasionally very narrow ones semi-terete, green, silvery- or grey-green, silvery-grey or rarely  $\pm$  glaucous, subglabrous to sericeous between the numerous, parallel, closely spaced, fine nerves; apex acute to acuminate. *Inflorescences* sometimes racemose with a very short, 1-2-headed axis; peduncles 1 or 2 per axil, 5-32 mm long, subglabrous to sericeous. *Flower-heads* globular, pale golden or cream-coloured, 3-8 mm diam., 15-50-flowered. *Flowers* 5-merous. *Sepals* 1/2-3/4-united. *Pod* moniliform, 15-34 cm long, 7-12 mm wide, coriaceous, twisted and coiled or nearly straight before dehiscence, longitudinally nerved, often conspicuously so, minutely sericeous. *Seeds* longitudinal, widely elliptic, compressed, 4-8 mm long, 4-6 mm wide, shiny, black, the pleurogram narrowly to broadly oblong and open, the aril terminal, bright orange, covering at least 1/3 of seed. Wirewood, Desert Oak, Dogwood.

*Distribution.* All mainland states except Victoria.

*Affinities.* Superficially resembling *A. stenophylla* (see below).

**1a. *Acacia coriacea* DC. subsp. *coriacea***

*Illustrations.* F. Mueller, Iconogr. Austral. *Acacia*, dec. 6, pl. [6] (1887); J. H. Maiden, Forest Fl. New South Wales 7(4): fig. 242L-T, (1920).

Bushy *shrubs* or *trees* 1-3 m tall, occasionally semi-prostrate and sometimes markedly wind-pruned (exposed coastal habitats). *Bark* thin, fibrous and hard. *Phyllodes* silvery- or grey-green, usually erect, 10-22 cm long, 1.5-10 mm wide, commonly 20-50 times longer than wide. *Flowering peduncles* 5-10 mm long. *Pods*  $\pm$  twisted and coiled before dehiscence, usually curved.

*Selected specimens examined.* WESTERN AUSTRALIA: inland of Sandy Point, Dorre Island, J.S. Beard 7092 (PERTH); Hearson Cove near Dampier, 6 Feb. 1981, G. Craig s.n. (PERTH 00613185); Dirk Hartog Island near Cape Inscription, B.R. Maslin 4297 (PERTH); north-east end of Enderby Island, Dampier Archipelago, B.R. Maslin 4691 (BRI, PERTH); about 5 km N of Exmouth Gulf Homestead toward William Preston Point, B.R. Maslin 4757 (BRI, PERTH); Dolphin Island, Dampier Archipelago, R.D. Royce 7164 (PERTH).

*Distribution.* North-western Western Australia along the coast and offshore islands from Dirk Hartog (Shark Bay) and Dorre Islands north-east to Point Samson near Wickham. A few specimens from north of the Tanami Desert in Northern Territory are provisionally referred to this subspecies, although they are distributionally and ecologically very anomalous. Indeed, they occur within the geographic range of subsp. *sericophylla* but their bark is described by the collectors as "fibrous". Future collecting in this area should take special note of bark characteristics to test our identification. The specimens which we have seen from north of the Tanami Desert and which we have referred to this taxon are: 40 mi. [64 km] E of Limbunya Station, R.A. Perry & M. Lazarides 2293 (PERTH); 10 mi. [16 km] W of Birrindudu out-station, R. Perry & M. Lazarides 2370 (PERTH); 35 mi. [56 km] SSE of Nicholson Station, R.A. Perry & M. Lazarides 2434 (PERTH). These collections are identified as the typical subspecies rather than subsp. *pendens* because they all have the characteristic relatively broad phyllodes and short peduncles of this subspecies.

*Habitat.* Coastal dune or beach sands most commonly, infrequently in red sands or in lateritic and limestone soils.

*Flowering and fruiting periods.* Flowering June-July; mature pods with seeds in August to November.

*Typification.* De Candolle described *A. coriacea* first in his Prodrumus (1825) and two years later in his Memoire on the Legumes (1827). The type sheet at herb. G-DC bears two branchlets, possibly representing different collections, one flowering and the other in very young fruit; we have assumed that the label on the flowering specimen applies equally to the fruiting branchlet. Because De Candolle described both flowers and young fruits in the protologue, either of the specimens on the type sheet could qualify as a lectotype. We have selected the left-hand specimen with young fruit as lectotype because it clearly represents the entity that most likely would have been encountered on the coastal islands by the Baudin Expedition and is consistent with the protologue. The identity of the right-hand (para-lectotype) specimen is equivocal, perhaps representing a narrow phyllode form of subsp. *coriacea* (*sensu lectotypico*) or even subsp. *pendens*.

The lectotype specimen is not labelled but data from the iso-lectotype collection at Paris establishes its provenance, namely, the west coast of Western Australia, collected by a member of the N. Baudin expedition of 1801. The G-DC paralectotype which is annotated "cote orient" is clearly an error.

The actual type locality cannot be determined with certainty but it is likely that the type collection came from either Bernier Island or one of the islands in the Dampier Archipelago. Certainly Bernier was visited extensively by the naturalists on the Baudin Expedition (Marchant 1982:154) and *A. coriacea* still occurs there. Although several times small boats were sent to search for a suitable place for landing on the coast of Shark Bay, and the "Geographe" itself made such a reconnaissance, Baudin left the area without the scientists ever having set foot on the mainland. After leaving Shark Bay on the way to Timor to restock supplies, near the end of July 1801, Baudin sailed north to the Dampier Archipelago where a detailed survey was made of some of the islands near Roebourne. Baudin did not permit the scientists to go ashore but some of the ship's company collected specimens for the naturalists (Marchant 1982:155), so it is not impossible that the type collection or part of it was made on one of these islands where the species can still be found.

*Affinities.* More closely related to subsp. *pendens* than to subsp. *sericophylla*.

*Conservation status.* Not rare or endangered.

**1b. *Acacia coriacea* subsp. *pendens* Cowan & Maslin, subsp. nov.**

A subsp. *coriacea* ramis plerumque pendulis phyllodiis flexuosis expansis usque ad pendulis, 55-110-plo longioribus quam latiores differt.

*Typus:* Hamersley Range National Park at Coppin Pool, 300 m. upstream from crossing, Western Australia, 12 May 1980, *M. Trudgen* 2518 (holo: PERTH; iso: CANB, G, K, NY).

*Trees*, rarely shrubs, (1)3-6(8) m tall with thin, hard and fibrous *bark* and gracefully pendulous branchlets and foliage. *Phyllodes* green, grey-green or silvery green, rarely subglaucous, 17-27 cm long, 1.5-5 mm wide, 55-110 times longer than wide. *Flowering peduncles* 5-10 mm long. *Pods* ± twisted and coiled before dehiscence.

*Selected specimens examined.* WESTERN AUSTRALIA: Paraburdoo, *K. Atkins* 1236 (BRI, PERTH); Barrow Island, *R. Buckley* 7246 (PERTH); 41.5 km W of Gascoyne Junction on the road to Carnarvon, *B.R. Maslin* 5002 (PERTH); 47.5 km SW of Marble Bar on the track to Spear Hill, *B.R. Maslin* 5265 (BRI, PERTH); Bulloo Downs Station, near E end of Lofty Range, *B.R. Maslin* 5285 (MO, PERTH); 8 km NE of Quarry Hill, *K. Newbey* 10623 (CANB, KARR); Depuch Island, *R.D. Royce* 7107 (PERTH); West Lewis Island, Dampier Archipelago, *R.D. Royce* 7422 (PERTH); Christies Crossing, Oakover River, *P.G. Wilson* 10378 (NT, PERTH).

*Distribution.* North-western Western Australia, predominantly inland from the coast in the Pilbara region. Extending from the Gascoyne River (Gascoyne Junction) north to the De Grey River (Yarrie Station) and as far inland as the Oakover River; infrequent along the coast and on offshore islands in the Dampier region.

*Habitat.* Mainly along rivers and creeks, on sandy soils and on stable sand dunes, less commonly on red sand and gravel in fringing woodland.

*Flowering and fruiting periods.* Flowering March to August; fruits with mature seeds collected July to December.



*Affinities.* Nearest the typical subspecies, especially with respect to bark characteristics. Both taxa are of some importance to horticulturists and are cultivated in native plant gardens in northwest Western Australia, for example at Karratha.

*Conservation status.* Not rare or endangered.

**1c. *Acacia coriacea* subsp. *sericophylla* (F. Muell.) Cowan & Maslin, comb. et stat. nov.**

*Type:* Based on the following.

*A. sericophylla* F. Muell., J. Proc. Linn. Soc., Bot. 3(11): 122 (1859). *Type:* desert along the Suttor R., Queensland, *F. Mueller s.n.* (holo: MEL (?), *n.v.*; iso: K).

*A. coriacea* DC. var. *angustior* Maiden, Forest Fl. New South Wales 7(4): 154 (1920). *Syntypes* (Queensland): Beta, *J.L. Boorman s.n.* (NSW 183183); Prairie, 30 mi. E of Hughenden, *R.H. Cambage* 3961 (NSW); Prairie, *J.R. Chisholm s.n.* (NSW 183181); New Angledool, Feb. 1900, *A. Paddison s.n.* (NSW 183180).

*Illustrations:* J.H. Maiden, Forest Fl. New South Wales 7(4): fig. 242U (1920); D.J.E. Whibley, *Acac. S. Australia*, 191 (1980); G.M. Cunningham *et al.*, *Pl. W. New South Wales* 358 (1981).

Shrubby, usually somewhat gnarled, *trees* 3-7 m tall, to 10 m in Queensland. *Bark* grey, thick and spongy, yellow inside. *Phyllodes* light green or grey-green, often pendent, 17-33 cm long, 1.5-12 mm wide, 60-100 times longer than wide. *Flowering peduncles* mostly 10-20 mm long, occasionally as short as 6 mm or as long as 32 mm. *Pods* straight or curved before dehiscence, not markedly twisted or coiled.

*Selected specimens examined.* WESTERN AUSTRALIA: Sturt Creek, 1.5 km E of Billiluna Station, *G.W. Carr* 3692 and *A.C. Beaglehole* 47470 (PERTH); 13 km SSE of E end of Clutterbuck Hills, Gibson Desert, *S.D. Hopper* 2883 (PERTH); 26.9 km from Ardjorie Homestead on road to Dampier Downs, *K.F. Kenneally* 9162 (MEL, NSW, PERTH); Cape Keraudren, *B.R. Maslin* 4864 (CANB, PERTH); 45 km NE of Whim Creek on North West Coastal Highway, *B.R. Maslin* 5255 (PERTH); 5 km NNW of Cooletha Hill, c. 65 km NE of Wittenoom, *K. Newbey* 10017 (KARR, PERTH); Bernier Island, Shark Bay, *R.D. Royce* 5979 (PERTH); Depuch Island, *R.D. Royce* 7092 (PERTH).

NORTHERN TERRITORY: Newland Creek, Elkedra, *G. Chippendale* 1184 (PERTH); Renner Springs, *N. Forde* 229 (PERTH); approx. 5 km W of Docker River Settlement, *A.C. Kalotas* 1524 (PERTH); The Granites Tenements, Tanami Desert, *A.C. Kalotas* 1710 (PERTH); Bushy Park Station, *P.K. Latz* 9416 (DNA, PERTH); 29 km N of Tanami, *J.R. Maconochie* 1729 (DNA, PERTH).

SOUTH AUSTRALIA: N side of Mt Lindsay near base, *D.J.E. Whibley* 6629-A (AD); Lake Eyre region, Marquelpie Paddock, Innamincka Station, *J. Reid* 1635 (AD).

QUEENSLAND: Gilruth Plains, E of Cunnamulla, *S.T. Blake* 14049 (BRI); 31 km E of Urandangi, *V.J. Neldner* 2063 & *T.D. Stanley* (BRI); NE of Alpha, *J. & M. Simmons* 1097 (PERTH); 20 mi [32 km] E of Hughenden Township, *N.H. Speck* 4527 (PERTH); Barcaldine, Mitchell Distr., *C.T. White* 12348 (BRI).

NEW SOUTH WALES: SE of Narran Lake, Boorooma Sta., *C. Boyd* (NSW 216911); between Mc Phee Yards intersection and Remington, E of Narran Lake, *D.J. McGillivray* 2897 (NSW); E of Cumborah, *P.L. Milthorpe* 3827 & *G.M. Cunningham* (NSW).

*Distribution.* All mainland states (excluding Victoria). Rare on offshore islands in north-western Western Australia but common inland, extending through central Northern Territory and extreme north-western South Australia to central Queensland and north-central New South Wales.

*Habitat.* In near-coastal areas of red sands and in finely textured red, loamy alluvial soils on open plains, often in "spinifex" country, but absent from heavier textured soils of the Channel Country in northern Queensland. In some semi-arid areas it frequently forms pure stands along watercourses (Pedley 1978).

*Flowering and fruiting periods.* Flowering March to July; mature fruits with seed collected October to December.

*Affinities.* Until now this taxon has been considered simply as *A. coriacea*, e.g. Pedley (1978:191), Cunningham *et al.* (1981:358), Askew and Mitchell (1978:74), Everist (1969:15), Whibley (1980:190) and Turnbull (1986:124).

It is a well-defined taxon, particularly with respect to its habit and bark characteristics, which makes field identification relatively easy. Unfortunately, bark characteristics are not generally given on herbarium specimens and it is often difficult to be certain of their identity. Future research may demonstrate the necessity of reinstating the taxon to specific rank.

*Conservation status.* Transcontinental; not rare or endangered

## 2. *Acacia stenophylla* Cunn. ex Benth., London J. Bot. 1: 366 (1842)

*Type:* New Holland [Lachlan River, New South Wales, June 1817], A. Cunningham (holo: K, right-hand specimen on sheet stamped Herb. Bentham 1854; iso: K).

*A. longissima* glauca pendula Rantonnet, Rev. Hort. 37: 138 (1866), an inoperative name.

*A. stenophylla* var. *linearis* Maiden, Forest Fl. New South Wales 7(4): 150 (1920). *Type:* not designated, *n.v.*

*Illustrations:* F.Mueller, Iconogr. Austral. Acacia dec. 6, pl. [5] (1887); J. H. Maiden, Forest Fl. New South Wales 7(4): fig. 242A-K (1920); D.J.E. Whibley, Acac. S. Australia 189 (1980); G.M. Cunningham *et al.*, Pl. W. New South Wales 373 (1981); B.R. Maslin in J.P. Jessop (ed.), Fl. Centr. Australia 123 (1981); L. Costermans, Native Trees Shrubs SE Australia 328 (1981); M. Simmons, Acac. Australia 2: 207 (1988).

*Shrubs* to straggly *trees* 2-20 m tall, the trunk to 60 cm diam., the crown sometimes rounded. *Bark* dark grey, fibrous. *Branches* normally pendulous, the branchlets glabrous to minutely sericeous, often pruinose, sometimes angular. *Phyllodes* ligulate, 20-40 cm long, 2-5 mm wide, thinly coriaceous, straight to weakly incurved, glabrous or appressed-puberulous, acute to acuminate, apex acute to acuminate, often strongly arcuate; nerves numerous, closely parallel but with diameters less than inter-nerve spaces. *Raceme-axis* 2-15 mm long, subglabrous to sericeous, rarely absent. *Peduncles* 6-13 mm long, glabrous to appressed-puberulous. *Flower-heads* globular, pale yellow, 6-9 mm diameter (dry), 25-40-flowered. *Flowers* 5-merous; calyx half length of corolla, 3/4-united; petals not contiguous above calyx in mature bud, densely sericeous apically. *Pods* moniliform, 10-26 cm long, 8-12 mm

wide, woody, smooth, glabrous except micro-puberulous on the constrictions between seeds, indehiscent but easily fragmenting between seeds. *Seeds* longitudinal, widely elliptic to oblong-elliptic, 7-9 mm long, 5-6 mm wide, dark brown, the pleurogram closed or nearly so, the funicle white and slightly enlarged at hilum, exarillate.

*Selected specimens examined:* NORTHERN TERRITORY: Stuart Highway at Newcastle Creek, T.S. Henshall 2502 (BRI, NSW, NT, PERTH); 6 mi NE Austral Downs H.S., G. Chippendale 1478 (PERTH).

SOUTH AUSTRALIA: 170 km west of Maree on road to Oodnadatta, J.Z. Weber 790 (PERTH); Murray R., between Renmark and Chowilla Station, 2 Sept 1982, B.R. Maslin s.n. (PERTH 00673382).

QUEENSLAND: 0.5 mi. [0.8 km] N of Weemalah, C. Slade 3 (NSW, PERTH); 15 mi [25 km] NW of Headingly Stn, R.A. Perry 864 (CANB, PERTH).

NEW SOUTH WALES: E bank of Gol Gol Creek, 0.5 km E of Gol Gol, L. Thomson LXT 197 (PERTH).

VICTORIA: Wallpolla Id, 0.5 km W of Finnegan's Bridge, G.R. Lucas 367 (MEL).

*Distribution.* Inland areas of all mainland states; extending from north-eastern Western Australia east through Northern Territory to Queensland (west of the Great Divide) and south to the Murray-Lachlan-Darling system in South Australia, New South Wales and Victoria. Disjunct in South Australia between Lake Eyre and the Murray River.

*Habitat.* Usually on banks and in floodplains of creeks and rivers in clayey soils.

*Flowering and fruiting periods.* Flowering March to June; mature fruits with seeds collected October or later.

*Typification.* *Acacia stenophylla* was described by Bentham (1842) based on flowering material collected by Cunningham from the Lachlan River, N.S.W. As was Bentham's practice in this work, no collecting number was attributed to the Cunningham gathering.

There are two sheets at Herb. K with specimens which seem most likely to represent the original material (both in flower) upon which Bentham based this name: the right-hand specimen on the sheet stamped Herb. Bentham 1854, the left-hand one on the sheet stamped Herb. Hooker 1867. These specimens are both mounted with other gatherings and each is annotated "*Acacia stenophylla*" in what appears to be Bentham's handwriting. Unfortunately the label details on these specimens are very deficient and it is only by considering both together that one can derive the provenance details given in the protologue: the Herb. Bentham specimen shows Cunningham the collector and the Herb. Hooker specimen gives the collection locality as "L.R." (i.e. Lachlan River).

The Herb. Benth. sheet bears, to the right of a pencilled dividing line, a flowering specimen we consider as the holotype. To the left of the pencil line there are two specimens, a small packet with pod segments and a cluster of detached phyllodes. A large handwritten label, in neither Bentham's nor Cunningham's hand, also to the left of the pencil line, gives the information "Lachlan River June 432/1817" and "Hunter River May 113/1825". Cunningham recorded in his journal the presence of pods for his 432 and it seems likely that the pods in the packet and the two sterile branchlets just above the packet represent this gathering. The several detached phyllodes are bound together by a label, possibly in Cunningham's hand, reading: "*stenophylla* and *pauciflora*"; these have the same appearance as the holotype and may be from that collection. The identity of the other collection referred to on the label,

namely *Cunningham* 113, is uncertain, for the same number is given on the type sheet of *A. pendula* but with April 1825 as the date of collection.

The Herb. Hooker sheet at K also has multiple specimens of *A. stenophylla*: the one on the left of a dividing pencil line is regarded as an isotype; the other two, collected on the Darling Desert Victorian Expedition, are of no type value.

Pedley (1978) regarded the holotype of *A. stenophylla* to be *A. Cunningham* 432; however, if our interpretations in the preceding paragraphs are correct, it cannot be a type because it is a fruiting specimen. It and the flowering (holotype) specimen have dried with a rather different appearance and it seems unlikely that they represent the same collection. It is, consequently, difficult to be certain of a collection number for the type, if, indeed, it ever had one. We have concluded that it is better to cite the holotype unnumbered.

*Affinities.* Very similar in appearance to *A. coriacea* especially on account of its habit, very long phyllodes and globular heads, but the similarity is probably more superficial than real. The main characteristics separating the species are summarised in the key above.

*Conservation status.* Widespread and neither rare or endangered.

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